DOCUMENT RESUME

ED 104 394 IR 001 796

TITLE	Supply/Demand Information System for Vocational Education in Texas. (A Subsystem of the Human Resources Information System).
INSTITUTION	Texas State Office of Information Services, Austin.
REPORT NO	OIS-Pub-7320-001-1272-1-RAN
PUB DATE	12 Jan 73
NOTE	91p.
EDRS PRICE	MF-$0.76 HC-$4.43 PLUS POSTAGE
DESCRIPTORS	Data Bases; Data Processing; *Educational Planning; *Human Resources; *Information Systems; Job Training; Labor Supply; Manpower Development; Occupational Information; Occupational Surveys; *Vocational Education
IDENTIFIERS	*Texas

ABSTRACT

To help develop a conceptual design and determine resources necessary to establish a Human Resources Information System (HRIS) in Texas, a task force investigated factors influencing the balance between individuals in training and demand for trained people. State data forms and federal forms used to collect data in Texas are reviewed. HRIS systems in use in other states are surveyed. The Occupational Demand Data Subsystem is studied, along with the Occupational Supply Subsystem. A conceptual presentation is given for a Texas system. Prediction methodologies, occupational coding structures, and recommendations are appended. (SK/JY)

ED104394

SPECIAL REPORT

001 726

OFFICE OF THE GOVERNOR
Office of Information Services

Office of Information Services, Box 13224, Austin, Texas 78711

ED104274

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SUPPLY/DEMAND INFORMATION SYSTEM

FOR VOCATIONAL EDUCATION IN TEXAS

(A SUBSYSTEM OF THE HUMAN RESOURCES INFORMATION SYSTEM)

IR 001796

Prepared by: Tri-Agency
Task Force
(TEA, TEC, OIS)

SUPPLY/DEMAND INFORMATION SYSTEM

FOR VOCATIONAL EDUCATION IN TEXAS

(A SUBSYSTEM OF THE
HUMAN RESOURCES INFORMATION SYSTEM)

Approved by: Tri-Agency
Advisory Committee
December 15, 1972

Approved by: Governor of Texas
Administrator of TEC
Commissioner of TEA
Executive Director of
Advisory Council for
Technical Vocational
Education
January 12, 1973

OIS Publication Number
7320-001-1272-1-RAN

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INTRODUCTION

The need for Texas to have a Human Resources Information System to collect, process, and report planning data has been documented by the Occupational Education and Technology Division of the Texas Education Agency, the Advisory Council for Technical-Vocational Education in Texas, the staff of the Human Resources Council, and the Coordinating Board, Texas College and University System. (See list of Human Resources member agencies in Appendix E.)

In national legislation on training and education, the United States Congress has been very explicit in indicating that manpower training financed by the Government should be based on future manpower needs. For example, in the Vocational Education Amendments of 1968, Congress declared the purpose of the Act to include assuring that persons who needed it will have "ready access to vocational training or retraining . . . which is realistic in the light of actual or anticipated opportunities for gainful employment" (Public Law 90-576, 90th Congress).

Also, in the Manpower Development and Training Act of 1962, the Congress stated that "improved planning and expanded efforts will be required to assure that men, women, and young people will be trained and available to meet shifting employment needs; that many persons now unemployed or underemployed, in order to become qualified for reemployment or full employment must be assisted in providing themselves with skills which are or will be in demand in the labor market", (Public

Law 87-415, as amended). Both information on occupational demand and occupational supply are needed to calculate as accurately as possible, by occupation, unmet demand, over supply, or an acceptable balance between the number of individuals in training and the demand for these trained people.

This report is the result of the efforts of the Interagency Task Force made up of a representative of the Governor's Office, the Texas Education Agency and the Texas Employment Commission. In August, 1971, the Advisory Council for Technical-Vocational Education gave top priority to a system to gather information in usable form for the planning and management of Texas vocational programs. The Human Resources Council was set up by the Governor in January, 1972, and again the need was expressed for helping the job seekers of the state of Texas as much as possible by the efficient use of both federal and state funds in planning and implementing manpower programs. And this can only be done using a source of information that is consistent, accurate and unbiased.

Then, in February, 1972, a meeting was held where representatives of the Governor's Office--Office of Information Services, the TEC and the TEA were present and reviewed and discussed various alternatives to initiate a conceptual study of a Human Resources Information System. Additional meetings were held and a selected approach was formulated. Also, an ad hoc committee was set up. The ad hoc committee met in April and developed specifications and plans for the work of the Task Force.

The following is an overview of the major objectives to be accomplished during the study. The primary goal is to develop the conceptual

design and determine resources necessary to establish a Human Resources Information System. The objective is: to design a system that would be continuous, systematic, visible, recurring and responsive. The information system should have a stable base, collecting, analyzing and disseminating useful and needed information for use by decision makers at all levels in the state. The task force should research existing statewide Human Resources Information Systems that are in existence in the United States, research the available data systems in Texas, identify the products to be produced through the system and determine the geographic regions for compilation and reporting of supply/demand information.

The ad hoc committee was expanded into the Advisory Committee. Then the Committee set up procedures to be followed and the method of funding the Task Force research. Representatives of the Governor's Office, TEA and TEC met on April 14 and completed the documentation and the plans for the study and agreed to set up a meeting with the Commissioner of Education, Texas Education Agency; Assistant for Program Development, Office of the Governor; and the Administrator of the Texas Employment Commission to inform them of the project. The meeting was held on April 26 and the plans of the Advisory Committee were approved. The initial effort of the Task Force was to start May 1 and continue for six months with regular meetings to be held by the Advisory Committee to provide advice and suggestions as the study evolved. The Task Force accomplished the objectives as planned and the major findings are presented in the chapters that follow.

The First Chapter, Data Investigations, Federal and State, presents information that is currently used in various systems already in operation. The accent of this chapter is on state data forms that are currently used and federal forms that are used to collect information in Texas.

The Second Chapter, Investigations of Human Resources Information Systems Used in Other States, primarily reviews Occupational Training Information System (OTIS) used in Oklahoma, the system in Utah and the system in the State of Pennsylvania.

The Third Chapter, The Occupational Demand Data Subsystem, is a review of the demand systems that were studied, primarily Tomorrow's Manpower Needs, the National Industry Occupational Matrix, the Occupational Employment Statistics Program (OES) and the Employment Services Automated Reporting Systems (ESARS), as a source of data only.

Chapter Four, The Occupational Supply Data Subsystem, is a chronological discussion of the major inputs of the supply data.

In Chapter Five, the Human Resources Information System for Texas, a conceptual presentation is given for a Texas System presented in the form of two major subsystems. Also discussed here are prediction methodologies, occupational coding structures and recommendations.

CHAPTER I

DATA INVESTIGATIONS - FEDERAL AND STATE

In May, 1972, information was collected from the TEC and the TEA by the Task Force. Included in the appendix is a facsimile of each of the data forms that are used to collect information for reporting by the TEC and the TEA. Only the forms that may relate directly or indirectly to the Human Resources Information System are included. The method and procedure for including the information on these data forms will be studied during the design stage. Some of the data included on these forms will probably not be used and other data may be used only for a checking or validating operation against outputs in the system to assure as much accuracy as practical. However, in the interest of avoiding unnecessary duplication, redundant procedures and wasteful forms design, these facsimile forms are presented.

The Task Force continued to collect information during June, 1972, and the Advisory Committee met to review what was accomplished.

A trip to Houston was made to consult with the Educational Service Center about their planned efforts in the area of Manpower Information Systems. The Houston Educational Service Center had installed the Computerized Vocational Information System (CVIS) and had other studies underway. Some funds were available to them from the Moody Foundation to explore such systems. The Educational Service Center was very interested in the work that the Task Force was doing at the state

level. They related their needs in the Houston area for information on manpower supply and demand. Local efforts in Houston to collect supply/demand information have been successful in the past; however, the usual problems of the data rapidly becoming obsolete and not having a standard methodology caused the reports generated to have only local value and very short useful life relative to their cost.

Also in June, the Task Force had the opportunity to have a presentation by a representative of the National Restaurant Association and a representative from Ohio State University on career ladders in the food service industry. While developing career ladders does not relate directly to a supply/demand system, it does involve occupational identification and skill levels. The classifications in the Dictionary of Occupational Titles and program classifications in the list of United States Office of Educational Training Programs are based on the accuracy with which different occupations and clusters of occupations are defined to set up training curricula.

Studies such as these can be used to improve the data in the Supply and Demand Subsystem.

Early in July the Task Force went to Oklahoma to review the Occupational Training Information System. Many of the original concepts documented by Dr. Paul Braden are still used in the system as it has developed. However, other procedures that proved to be not workable for some reason or another have been discontinued. Many of the elements in the Oklahoma system were very well developed and will be discussed later in this report. One of the major problems in a complex system that involves several autonomous agencies is that during the

implementation and operation phases it is often difficult to receive the inputs in a consistent form according to a strict time schedule. And, if these inputs are not received accurately and on time, the resulting reports from the system will be useless and may not be used as conceptually intended. For example, the data may not be used in a state plan for Vocational Education for any one of several other reasons mentioned above.

However, the data may still be useful to other users and the output from the subsystems may have extensive usefulness on their own. A facsimile of some of the forms used in the Occupational Training Information System of Oklahoma are included in the appendix.

Also in July, data was collected from the Coordinating Board, Texas College and University System. Facsimiles of some of the major forms are presented in the appendix.

Later in the same month, a trip was made to Washington, D.C., to visit the Department of Labor's Manpower Administration and the Bureau of Labor Statistics to review the latest information relating to plans on the national level for occupational statistics. This information will be developed in a later chapter, as it comprises the major Demand Subsystem.

In August, 1972, a trip was taken to review the Texas Job Bank System run by the TEC. The Job Bank visited was the one in operation in San Antonio. This is an extensive computerized system where employer job requirements and referrals to such jobs are tabulated by computer so as to provide current information on job openings. This system, when working, offers the ultimate in current Demand Concepts.

The TEC has plans to operate Job Banks in all the major metropolitan areas and ultimately on a statewide basis. While Job Bank is the desired system on a by-individual and by-firm basis, it does not satisfy the needs for vocational education planners who must have forecasted and projected information and occupational clustering. Therefore, it is important in designing the supply and demand information system for Texas not to confuse the concept of a by-firm, by-individual system with a statewide concept of projections and forecasts by occupation and industry.

In some of the systems studied by the Task Force, these two concepts were often overlapping. It is important in conceptual design not to have the system appear to be all things to all people and result in being nothing to anybody.

The Job Bank has extensive national and state support and has been started in several states and major Standard Metropolitan Statistical Areas in Texas.

In late August a meeting was held with the Acting Director of the Proprietary School Division of TEA. A discussion was held concerning the authorizing legislation to license proprietary schools in Texas. As this is a relatively new law, many problems have been encountered in getting the various schools in full compliance with the law. The data required to be collected is not complete enough for purposes of this study. However, information required to be on file in the various schools may or may not provide the needed information. Data forms collected from the division are included in the appendix of this report. Information on enrollments, completions and placements of individuals

in proprietary schools is an important element of the supply subsystem and must be developed at some future date to be a reliable input into the system. Legislation may be needed to require the schools to provide certain information. This should be explored with those that initiate legislation. It is recognized here that the development of this source of information is at a very early stage; however, it should be developed to whatever degree of completeness is practical within the free enterprise system.

Early in September a meeting was held in Austin with the Director of the Bureau of Apprenticeship and Training of the Department of Labor. Information collected by the Bureau is currently processed on computer and reports are provided. Information is provided on each apprentice by occupation. The report shows the number of apprentices enrolled at the beginning of the period, the number added, the number terminated or suspended, the number of completions and the total at the end of the period. Samples of these reports are provided in the appendix. While the data from the Bureau of Apprenticeship and Training may not in itself constitute a very large number of individuals compared to the total sum of all supply sources, the information nevertheless should be provided and included in a system of Manpower Supply and Demand. The development of this source of information should be considered while designing and implementing a total system. Information is not at the present time in a desirable form. For example, occupational titles are taken from the Dictionary of Occupational Titles (DOT); however, the Bureau of Apprenticeship and Training does not use the DOT code numbers. For the data to be used in a system, the code numbers would have to be

added to the information before input. This is a typical problem that was encountered with many of the data inputs in this study.

Also in early September, a list of the data processing needs of the Department of Occupational Education and Technology was discussed with the Texas Education Management Information Center. The schedule of reports and completion dates for computer programs and other information is provided in the appendix of this report.

In September the Health Resources Council met and discussed the various projects that are under development. The Council spent some time in discussing the expenditures on a statewide basis for social services provided for the individuals in the state of Texas. One category of these social services is employment services of all kinds. Information on employment services such as the number of enrollments by federal or state program and/or by geographic area would be provided in a Human Resources Information System.

CHAPTER II

INVESTIGATIONS OF HUMAN RESOURCES INFORMATION SYSTEMS FOR OTHER STATES

Oklahoma - Occupational Training Information System (OTIS)

The OTIS system as it is operated by the Department of Vocational Technical Education in Oklahoma was developed in response to two studies, conducted in 1967, pointing up a need for better information on which to plan for manpower programs. The overall purpose of the project was to develop and initiate a continuous and detailed system to provide a better data base for encouraging necessary changes in Oklahoma's State Plan for Vocational Education and in consequent patterns of occupational offerings and enrollments. The system was designed as a decision-making tool and was not conceived as a "cure-all".

Statewide data were compiled along with data for eleven geographic regions selected jointly by the Oklahoma Employment Security Commission (OESC) and the State Department of Vocational and Technical Education. These two agencies also jointly agreed upon the approximately 300 occupations to be included in the study. The Oklahoma Employment Security Commission designed ten questionnaires to survey the State's employment. This survey was done on a stratified sample basis to yield valid information for the eleven regions as well as statewide totals. (See Appendix G for sample industry questionnaire). All demand data included in the OTIS system is provided by the Oklahoma Employment

Security Commission under a contractual agreement with the State Department of Vocational and Technical Education and the Governor's Office.

In the initial stages (1967) of the OTIS project, the OESC made estimates (based on a special survey) of current statewide (and region-wide) employment, and also estimated future (one, two, and three years) demand for workers in the 300 selected jobs, grouped into 86 job clusters. The firms sampled were selected by "Vocational-Technical" from an industry, firm-by-size listing of employers subject to the State's Unemployment Compensation Laws. This survey was up-dated each year. A special agreement between "Vocational-Technical" and OESC allowed the data to be transmitted on a "by-firm" basis. This agreement somehow satisfies the confidentiality restrictions required by the State laws.

The supply of workers estimated to be available for work in each of the 300 occupations is derived from a report of registrants for work who filed job applications with the OESC, and from a student accounting system maintained by "Vocational-Technical". Other supply information is gathered from all public and private schools. Efforts are made to secure the number of "entrants into the labor market", and not just "graduates". Dropouts with marketable skills are just as much a part of supply as are those students who complete training courses. Other sources of supply not considered in OTIS will be discussed elsewhere in this report.

The primary supply population in the OTIS system includes enrollees of all sub-professional occupational programs in Oklahoma:

(a) full-time public programs,

(b) adult public programs,

(c) MDTA programs,

(d) private schools,

(e) industrial and government on-the-job training programs,

(f) registrants at OESC offices, or

(g) selected non-federally reimbursed vocational and technical programs which, although not reimbursed, are significant to total manpower supply.

Utah's Occupation-Industry Matrix System

The Utah Department of Employment Security has developed, over a number of years, an occupation-industry matrix for the state of Utah. This matrix is a 90x3000 cell (90 industry breaks and 3000 occupations) computer-housed table shell into which the employment level of each industry in Utah is divided and distributed into appropriate occupational components. Detailed information distributed within the table shell can be rearranged, summed, and presented in a variety of formats. The entire matrix, of some 270,000 cells, would be too unwieldy as a direct print-out.

The occupational distribution is accomplished with data collected from employers through the use of a mail questionnaire and follow-up telephone calls or firm visits. When completed, these questionnaires provide that firm's occupational pattern. The employment distribution among the various occupations is a record of the judgment of the various employers regarding the most efficient combination of occupational skills needed to meet their companies' objectives. Likewise, the

manpower requirements of an industry are reflected in the composite staffing patterns of the firms within that iduustry. It has been noted that, while the employment level for each occupation may change significantly over a relatively short period of time, the proportional distribution apparently does not change appreciably. This occupational total collected at the company level but viewed at the industry level, provides the basis for making conditional estimates of manpower requirements.

The occupational data collected from employers were in some cases obtained from a universe of firms rather than a sample. This is much more practical and less costly in a state the size of Utah than it would be in Texas. The work force in the entire state of Utah is smaller than that of the Dallas or Houston Standard Metropolitan Statistical Area and less than one tenth the size of the Texas labor force. The sample taken in Utah was primarily from the small firm category while the universe was used for large firms. There are about 27,000 firms in Utah compared to over 200,000 in Texas.

Utah's Department of Employment Security is now one of the pilot states in the Occupational Employment Statistics program. However, Utah is providing the BLS its required firm sample data from their own structured questionnaires rather than the structured survey instruments used by BLS. The industries in Utah are surveyed in a three year cycle and to this date only one point of reference for all industries has been established. The occupational distribution within the matrix is being used for current and projected future employment levlls. Industry employment levels are projected using various techniques contained in Tomorrow's Manpower Needs and other sources.

The most important advantage of this system is that, instead of using the national average occupational profiles contained in the U.S. Industry-Occupation matrix, Utah can break its employment into occupational groups that, without a doubt, represent staffing patterns of Utah firms.

Planning Vocational Education Programs in Pennsylvania: Guidelines for the Use of Labor Market Information

This study agrees that the methodology for making quantitative projections of supply/demand relationships is subject to considerable error. Although no one method has been considered as being exceptionally accurate, the statistical projection method developed by the Bureau of Labor Statistics, U.S. Department of Labor and published in Tomorrow's Manpower Needs was used in making the Pennsylvania projections to 1975. The matrix contained in the above publication was also used to establish the occupational profiles.

However, the Research Coordinating Unit, Bureau of Educational Research, Pennsylvania Department of Education also estimated the supply of workers. The supply totals represent the total number of vocational graduates (those available for labor force entry) from the nine following sources: Public Secondary Vocational and Technical Schools, Community Colleges, Private Trade and Technical Schools, State Trade and Technical Schools, Manpower Development Training Programs, State Retraining Programs, Two Year Programs in Four Year Schools, Private Junior Colleges, and Private Business Schools. The supply/demand posture is the relationship between the output from the above mentioned sources

and the projected demand. This approach assumes that, upon graduation, the graduate is immediately available to enter the labor force in the occupation for which he was trained.

However, not all occupational graduates enter jobs for which they were trained and a certain number do not enter the civilian labor force. Some complete military obligations and/or continue their education before entering the civilian labor market. Some women upon graduation become housewives. The supply data does not include those whose training was accomplished on-the-job or with a specific employer, including apprenticeship training.

The publication points up some limitations to the manpower information included in the report. The projections are not intended to be the "final word", only indicators to be used in planning. It must be remembered that the data are to be used only as guides or tools and that the trend is the important factor. Numerical accuracy is dependent on many factors, some of which are undefined or unknown at this time.

CHAPTER III

THE OCCUPATIONAL DEMAND DATA SUBSYSTEMS

Phase I Demand Data Subsystem

It has become increasingly evident that the occupational composition of the labor force, as well as the skills required in each occupation, change through the years. This is especially true in a growing economy such as Texas has experienced. To plan education and training programs to meet future manpower needs, projections are needed of these changing manpower requirements. While current data on the occupational composition of the work force is needed as a basis for making future manpower projections, present needs, in themselves, are an uncertain guide on which to plan training programs. Planning education and training programs with the idea of bringing about more balance between manpower requirements and the trained labor supply will enhance the productivity of the economy and the earning power of workers, and help minimize structural unemployment.

Future manpower requirements are manifested in two main sources, job expansion and worker replacements. The first, job expansion, is the demand for workers created by a growing economy and expanding population. Industrial expansion and new industries locating within the state provide much of this demand. The second factor creating future manpower requirements is the demand for replacement of workers currently holding jobs. Retirements and deaths of workers create much of the replacement demand.

However, there are withdrawals from the work force for a multitude of reasons which create temporary or permanent job slots.

Educational planners need some system to systematically provide occupational demand and supply information. The primary function of such a system should be to gather, produce, process, and package data for use in planning and evaluating training programs. The more direct relationship between vocational type training courses and the "world of work" and greater fiscal accountability requirements for funds expended for vocational type training, make planning in this area more critical than in planning for general higher education. Therefore, any data information system adopted should be geared to, but not necessarily limited to, providing as much data as possible on those occupations which can be trained through vocational or technical courses.

The planning for, and design of, a Human Resources Information System for Texas should be made with as much knowledge as possible about existing sources of occupational demand data. The following paragraphs contain a review of the demand and/or supply/demand systems reviewed by the Task Force prior to making recommendations on a Texas system design.

Tomorrow's Manpower Needs

Currently, the data on future occupational demand that are being used in the Texas Education Agency's Texas State Plan for Vocational Education is provided from information contained in Texas Employment Outlook to 1975 by Industry and Occupation. This publication was prepared by the Texas Employment Commission's Manpower Data Analysis and Research Department

utilizing the national industry-occupation matrix. This matrix is a tabulation of the occupational staffing patterns of some 116 industry groups with 162 occupational breaks. The industry-occupational matrix is a set of occupational patterns of industries representing the entire economy. (An occupational pattern for an industry is the percent distribution of occupational employment in that industry.) This matrix was prepared and published by the U. S. Department of Labor, Bureau of Labor Statistics, in its four volume publication, Tomorrow's Manpower Needs. Through this publication BLS has provided a basis for developing manpower requirements information for states and areas through the use of national manpower information. This was needed because the manpower legislation passed in the early 1960's emphasized the need for projections of occupational requirements and supply information. However, very few states had any data on the occupational composition of their labor force. Thus, they were hampered in providing data on occupational demand to the people responsible for educational planning.

Tomorrow's Manpower Needs provides a means for making State occupational manpower projections within the framework of national projections and using national average industry staffing patterns in lieu of state occupational profiles. Obviously, staffing patterns developed from local data alone would be superior to national patterns for this purpose. However, in some industries, such as restaurants, hotels, and banks, local occupational patterns may not differ significantly from the national patterns.

With the exception of a few area skill surveys done in the late 50's and early 60's, in selected areas, there has been no regular program to gather occupational data on the labor force of Texas. In fact, prior to

the installing of the Bureau of Labor Statistics-Manpower Administration Occupational Employment Statistics program in 20 pilot states during 1971, only a very few states gathered any employment data by occupation. The O.E.S. program will be discussed later in this report.

The basis for the methodology used in Tomorrow's Manpower Needs is the statistical projection of Statewide employment levels by industry. The future employment level of individual industries is a primary determinant of occupational requirements, because each industry has a unique occupational structure. A number of alternate techniques can be used to develop these industry employment projections. The techniques or mix of techniques used are dependent on such factors as the resources available for projections, including the size and technical sophistication of the available staff, the volume of projections required, the purpose of the projections as they affect the need for accuracy and industry detail, and the availability of computer assistance. All of the techniques involve statistical comparison of State industry employment levels with one or more independent variables and the extrapolation of the resulting relationships.

Lack of computer capability, as was the case with Texas Employment Outlook to 1975, limits the selection of projecting techniques to the less sophisticated procedures. Multiple regression techniques (the comparison of state employment to multiple independent variables in the same equation, i.e., $y = a + bx_1 + cx_2 + \ldots + Nx_n$) is just not feasible without the use of a computer. Therefore, the Texas projections were made using trend projections and simple least squares regression techniques.

Two of the following relationships established during the years 1958 through 1967 were used for each of the 116 industries: (1) the relationship of state employment to national employment in the same industry, (2) the ratio of state to national employment over time, (3) the annual changes in state employment to annual changes in national employment, and (4) state employment over time. However, no mathematically derived industry wage and salary employment projections were accepted at face value. It is possible to have a beautiful mathematical equation which is correctly done and end up with a negative employment level. Each industry projection was reviewed and revised in accordance with information contained in various other studies and based on staff members' knowledge of probable industry employment directions. The 1958-1967 base period data was derived from regular estimates of statewide employment by industry provided by the Manpower Data Analysis and Research Department of the Texas Employment Commission. The data was adjusted to match the matrix industry classifications.

After the projections of private wage and salary employment, by industry, are completed they must be modified to include the other three classes of workers, i.e., self-employed, unpaid family workers and government workers. Further adjustments to wage and salary employment should be made to account for persons employed but not at work (unpaid absences) and to adjust to a one-person one-job concept by deducting the secondary jobs of multiple job holders.

Once industry employment estimates on the total employment concept have been developed for both a base year (i.e., 1960) and a target year (i.e., 1975), first approximations of projected occupational employment

requirements can then be derived through application of the matrix. This is a purely mathematical procedure; however, the size of the matrix is over 37,000 cells, and errors are easily made when cross tabulating to obtain occupational totals. Computer application of the matrix will sharply reduce both the time needed to revise the projections and possible errors. A control factor, computed by dividing the base period matrix (derived occupational distribution) by the census occupational distribution is applied to the target year occupational distribution to obtain the target year occupational totals.

These totals represent the expected level of employment in a given occupation in the target year. In planning for the training of workers it is not enough to have an estimate of how many more jobs will be available at a future time. It is also essential to have some idea as to the number of current workers who will leave the labor force during the forecast period, thereby creating a demand for trained workers. This is the "replacement need" and is caused by labor force withdrawals for a variety of reasons. Retirements and death create a large portion of this "replacement need" for trained workers. This portion of the demand is estimated by applying withdrawal rates, developed by BLS during special labor force and "working life" studies, to the occupational employment levels.

Detailed instructions for this Industry-Occupational Matrix is contained in the four volume Tomorrow's Manpower Needs, along with two supplements and a revised Volume IV available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402.

A companion volume Handbook for Projecting Employment by Occupation for States and Major Areas was prepared by the former Bureau of Employment Security (now the Manpower Administration); it is in draft form and has not been published. Computer tapes containing the matrix detail for 1960, 1967, 1975, and 1980 are also available from the Bureau of Labor Statistics. These tapes and "canned" programs for making industry projections are available to the Texas Employment Commission through the Federal-State cooperative program.

An extension of the Tomorrow's Manpower Needs approach is also being conducted by the Bureau of Labor Statistics in cooperation with the Bureau of the Census, U. S. Department of Commerce. These two agencies are cooperating in a program to develop an industry-occupational matrix for each state using data collected during the 1970 Census. This will be an expanded matrix containing 228 industry breaks and 440 occupational groups. The program will also provide other data such as occupational survival rates for each of the 440 occupational groups.

There are two main complaints about the results of the industry-occupational matrix system as applied to local industry employment projections: first, there are some very large residual occupational groups where it is impossible to attach meaningful occupational titles and, second, the occupational breaks are not clearly tied to a detailed occupational code either from the Dictionary of Occupational Titles or the U. S. Office of Education code structure. There is not enough detail in the occupational break down of the matrix. Also the U. S.

data is not adequate to make projections for areas smaller than a state or large Standard Metropolitan Statistical Areas. There is also the possibility that Texas industries do not have occupational profiles that match exactly the United States average industry staffing pattern, as depicted by the matrix occupational distribution. Projections made through this system are also made within the framework of certain economic assumptions that are highly subject to change during the forecast period.

User knowledge of these assumptions (listed in Tomorrow's Manpower Needs) and recognition of the risks and limitations inherent in economic forecasting of any kind make the projections provided through this system very worthwhile as guidelines to future manpower needs.

Occupational Employment Statistics Program

As stated in the previous section, a system that gathers and uses data on the occupational mix of industries located within the particular state or area would be superior to one using the national average occupational profile data. The Occupational Employment Statistics Program of the Bureau of Labor Statistics has this as its first objective. The first stated objective of the OES program is, "The development of occupational employment estimates (i.e., staffing patterns) by industry, which will serve as the basis for producing a time series of estimates of total employment by occupation. The occupational detail developed through this program must meet the data needs of the cooperating state, as well as the national needs of the Department of Labor and other federal agencies."

The OES is a federal-state cooperative program which started with ten pilot states and has now been expanded to include twenty state employment security agencies in cooperation with the Bureau of Labor Statistics. As soon as funds are available the program will be expanded to include the other states. Although BLS and the various state employment security agencies have had considerable experience in conducting specific occurational employment surveys, a manpower survey of the magnitude and complexity of the OES program has never been undertaken. A further objective of the OES program is: To provide occupational information in a form that can be used for the development and improvement of industry-occupational matrices at the national level, as well as for each state and for subdivisions of each state. Therefore, the design of the OES program reflects the ultimate use of survey data not only to expand and improve the national matrix, but also in the development of matrices for states and areas.

Comparability of data collected in prior surveys is also designed into the system along with the objective: To provide data to make possible the study of the occupational composition of industries. This objective will attempt to provide data to determine:

(a) how occupational composition differs within an industry by size of establishment, process, and other factors;

(b) how much interestablishment variability there is;

(c) how occupational composition changes over time, and how this information can be used in projecting future changes;

(d) whether in some industries occupational composition is so similar from firm to firm that it is unnecessary to collect data in all states and areas reflecting that, if true, a comparatively small national sample may be used to reliably estimate state and area staffing patterns, and thus reduce the cost of the program. To make these kinds of analyses, occupational composition data are needed for individual firms in each detailed industry.

At this time, there are twenty states participating in this program, with plans to bring in other states as soon as resources are available. The first nationwide sample survey of approximately 50,000 manufacturing establishments (excluding Printing and Publishing) began in late 1971, with the survey of 80,000-100,000 nonmanufacturing establishments to begin in late 1972.

The first complete cycle of data collection (i.e., manufacturing and nonmanufacturing) will be considered as a program development phase. In the third year of the program, those nonmanufacturing industries not included in the second year will be surveyed, and provided resources are available, manufacturing industries will be resurveyed including Printing and Publishing.

The samples will be drawn to provide national estimates; however, there is provision for the states to supplement the BLS sample survey questionnaire to obtain data for additional occupations or other local data needs. Estimates will be developed, where feasible, first at the 4-digit Standard Industrial Classification (SIC codes) industry level

to provide more accurate 3-digit estimates, to provide the basis for analyses of industry-occupational composition by size class at the 4-digit level and to serve as a data bank of occupational patterns that can be used by State manpower analysts to develop estimates for States and subdivisions of States. In this regard, the provisions for maintaining the confidentiality of these data will be consistent with those of other Federal-State cooperative programs.

The surveys are conducted by mail with 33 separate structured questionnaires (about 80 standard occupations listed with an open end feature) covering the manufacturing industries. The nonmanufacturing questionnaires will also be structured with a standard list of occupations and a list of other occupations that are important in terms of employment size in the particular industry covered and/or those requiring a substantial period of education or training. Many of these occupations will be those peculiar to particular industries. The 33 separately designed questionnaires for manufacturing should produce national estimates for 1,500 occupations for manufacturing alone.

The cooperating State employment security agencies in the OES program will use the survey results to develop estimates of occupational employment in the States and subdivisions of the States, by industry. State agency representatives have stated the objective of using the information on industry-occupational patterns coming from the survey to construct industry-occupational matrices covering wage and salary employment. These matrices, in turn, will provide the basis for projecting occupational requirements and produce one of the basic ingredients of a comprehensive manpower information system.

The OES survey data will provide, for most States, the most detailed estimates ever available on occupational employment at the State and area level. However, a sample survey of the type described in the previous section has certain limitations when data from the survey are used by States to develop State or area estimates of occupational employment. For example, the survey vehicle may not identify separately all occupations that are considered important by the respective States; the response to the survey (and conceivably the sample for the survey) may not be sufficient to develop estimates of occupational employment in certain industries or in certain subdivisions of States, directly from survey results; or there may be problems involving confidentiality of survey results. (The provisions for maintaining the confidentiality of the data collected through this program will be consistent with those of other Federal-State cooperative data collection programs.)

Despite these shortcomings, when the survey data are supplemented by other occupational information available to the respective States, it will be possible to develop occupational estimates reflecting the industrial composition of States and areas in great detail. For a better understanding of steps that the individual States can take to supplement survey data or to develop estimates in lieu of survey data, the examination of some hypothetical situations will be illustrative:

(1) If a State is not able to obtain sufficient response to develop occupational estimates for a specific industry or industry size class, it may utilize occupational patterns for that industry or size class from information in Tomorrow's Manpower Needs.

(2) In a second situation there may be only two establishments in the universe for a certain industry in a particular State, and, hence, there would be a problem of confidentiality in releasing survey data covering this industry. This does not mean that the State cannot use these data in the development of occupational estimates, it only means that it cannot be published separately by the State. For publication purposes, the information can always be aggregated with that obtained for the next largest classification, of which the industry in question is a part, and for which no problems of disclosure exist.

Development of total estimates of employment in an occupation will require going beyond the survey in some cases. Estimates for the approximately 80 common occupations that are standard on all survey questionnaires will be developed from the survey. In those cases where occupations lsited on industry questionnaires are unique to one industry, the results of the survey will produce an estimate of total employment for the occupation. Only for those occupations not among the 80 common occupations, whose numbers in some industries are so small that they were not included on the questionnaire for those industries, or those occupations not included among the important occupations unique to one industry, does a problem arise. Using other sources of data such as the 1970 Census of Population and the national and State industry-occupational matrices, including those State matrices developed independently of the OES program, State analysts can develop approximations of the number of workers in those occupations

in industries where they have not been identified separately in the survey documents or where they have been identified in only a few industry survey documents because of their lack of importance in some industries.

The Bureau of Labor Statistics has primary responsibility for the technical development and adequacy of the statistical system. Assistance on technical matters will be provided by BLS regional office staff to State agency personnel on such subjects as occupational classification (with regard to the job content of occupations listed on the structured questionnaires), sampling, tabulating, and estimating procedures, to insure consistent data input and technically sound program outputs. The BLS is responsible for the preparation of the various technical program materials, with the concurrence of the Manpower Administration, including the manual of operating instructions, and for the tabulation, estimation, analysis, and publication of the national data.

The Manpower Administration has primary responsibility for the administrative and budgetary aspects of the program, determining in consultation with BLS, the personnel resources and funds required, and providing guidance and assistance to the States in the use of personnel resources and funds allocated for the program. The Manpower Administration also has primary responsibility for providing guidance and assistance to the States in the use and application of State and area occupational employment statistics information in manpower programs and employment service operations.

The cooperating State employment security agencies are responsible at the State and local level for the operation of the occupational employment statistics program in conformity with the technical program materials prepared by BLS with MA concurrence. Specifically, cooperating State agencies are to:

(1) Supplement the national sample to allow for the preparations of occupational employment estimates for the State level and one or more Standard Metropolitan Statistical Area within the State.

(2) Handle the data collection for the establishments included in the national sample as well as the supplemental sample in their States.

There are other technical areas of cooperation required between the State agency, the BLS, and the MA national offices; however, they are not necessary to this "over-view" of the OES program.

The Dictionary of Occupational Titles (DOT) is used as the basic, or primary, source of occupational titles and definitions for the OES structured survey schedules, since it provides the most comprehensive coverage of such information. Furthermore, the DOT is used extensively by the primary users of occupational data as a basic classification system, and considerable work has already taken place to relate DOT codes to educational curriculum and to other occupational classification systems. With a few exceptions, when operational, this program could provide the basic data needed to construct the demand subsystem of a comprehensive occupational supply/demand data information system or "manpower" information system.

A request has been forwarded to the Bureau of Labor Statistics by Mr. Henry Rothell, Administrator of the Texas Employment Commission, requesting that Texas be among the next states funded for the OES Program.

Employment Services Automated Reporting System

The primary purpose of ESARS is to provide a reporting system based on individuals served rather than upon counts of transactions. ESARS is a computerized reporting system designed to provide data on employment security services to applicants with the aim of improving service and to provide data on which to evaluate and fund programs. The ESARS data file can provide the number of applicants registered with TEC offices by occupational codes and the number of nonagricultural job openings listed by selected job codes. (See Appendix C)

Special Studies

The OES data collection phase will be only for nonagricultural industries and will cover only wage and salary employment. However, at the local level this data can be supplemented with data from other sources and estimates of the other classes of workers in the labor force (i.e., self-employed, unpaid family workers, proprietors, members of unincorporated firms and private household workers) to arrive at the total employment level. A prime example of this supplemental data for the Texas system should be the information gathered by Dr. Conrad Fritsch, A&M University, in his project, "A Study of Manpower Training Requirements for the Texas Agricultural Industry." Other supplemental data could possibly come from the information gathered by the Texas Health Careers Program and the Governor's

Office of Comprehensive Health Planning in connection with the publication Allied Health Manpower in Texas,1970.

Special studies, such as Allied Health Manpower in Texas, 1970 prepared by the Texas Health Careers Program and the Governor's Office of Comprehensive Health Planning, will add valuable information to a Human Resources Information System for Texas. This publication provides data that could, and should, be used to supplement the occupational profiles contained in the matrix published in Tomorrow's Manpower Needs. Actually, the data in the Texas study represents the first step in gathering information on which to establish the occupational composition of the entire Texas labor force.

While the study was primarily interested in those people employed in the allied health professional and technical occupational categories, it did not disregard other occupations. Many persons perform the business, clerical, and maintenance services essential to the operation of health facilities and agencies, but these occupations are not unique to the health field. There are many, many jobs throughout the labor force that are common to all industries.

A Human Resources Information System requires information on the demand for trained people; not only in those occupations common to all industries, but also in the industry-unique occupations. As stated in an earlier section, the industry mix of a state, or area, is the primary determinant of the overall occupational structure of the area's labor force. Data gathered during studies such as the health manpower study provide information on the occupational structure of an

industry which may, or may not, be unique in its technical sophistication, location, or organizational structure. This type data is needed to revise the occupational profiles in the United States matrix until such time as data on all Texas industries and occupations can be established.

Phase II Data Demand Subsystem

Current Employment Series (BLS 790 Program)

The CES program provides the primary industry employment time series data used to make projections of employment levels prior to application of occupational detail, from whatever source. All data on employment maintained by the Texas Employment Commission, including the data from quarterly reports of employment and wages, required of employers covered by the Texas Unemployment Compensation Act, are used to make projections of future industry employment levels.

The Bureau of Labor Statistics collects data each month on employment, hours, and earnings from a sample of establishments in all nonagricultural industries including government. In 1972, this sample included over 160,000 reporting units. From these data, a large number of series on employment, hours, and earnings in considerable industry detail are prepared and published monthly for the United States as a whole, the fifty States and the District of Columbia, and most major metropolitan areas. The data include series on total employment, production or nonsupervisory worker employment, women employment, average hourly earnings, average weekly earnings, average weekly hours, and

average weekly overtime hours (in manufacturing). For many series, deseasonalized data are also published.

These data constitute the largest body of economic statistics in the world prepared on a current monthly basis. The statistics produced are among the most widely used of all economic indicators in the United States. These employment, hours, and earnings statistics are widely used throughout the Federal government for the formulation of policy and also by private business, labor organizations, and State and local governments. They also provide a major source of data for economic research and analysis, on such subjects as the changing industrial character of the economy, productivity trends, geographic trends in industrial activity, and the employment situation in each local area. The average hourly earnings statistics are used in collective bargaining, and in estimating changes in labor costs per unit of product. Weekly earnings are used as a measure of the welfare of workers; together with the index of consumers' prices they measure real earnings. A number of industrial companies use the earnings data to escalate labor costs in sales contracts for goods requiring a long time to manufacture. Employment and earnings data serve as important ingredients of two of the nation's other major economic indicators, the index of industrial production prepared by the Board of Governors of the Federal Reserve Board and the national income statistics prepared by the United States Department of Commerce.

The data are disseminated not only through the publications of the Bureau of Labor Statistics, but through those of many other Federal agencies, e.g., the Department of Commerce, the Board of Governors of

the Federal Reserve Board System and the Council of Economic Advisors republish all or part of the data. They are also regularly republished in summary form or for specific industries in many trade association journals, the labor press, and in general reference works.

The primary collection of the data is conducted by State agencies which have cooperative agreements with the BLS. In most States, this is the Employment Security Agency, the organization which administers the State unemployment insurance program. In a few cases, the State Department of Labor acts as the agency. The agencies mail schedules to a sample of establishments in the States which collect the required information each month. A "shuttle" schedule is used (BLS form 790 series) that is, one which is submitted each month in the calendar year by the respondent, edited by the State agency and returned to the respondent for use again the following month. The State agency uses the information provided on the schedules to develop State and area estimates of employment, hours, and earnings and then forwards the data either on the schedules themselves or on punchcards or machine listings to the Washington, D. C., Office of the Bureau of Labor Statistics. There, these materials are used to prepare estimates at the national level.

The shuttle schedule has been used in this program since 1930, but there have been substantial changes in its design and in the data collected over the period. All aspects of the schedule, its format, the wording of the requested items and definitions, and the concepts embodied therein have been subjected to a continuing and intensive review over the entire period, not only by the staff of BLS and of the State agencies, but also by other government agencies and by numerous

persons in private business and labor organizations. In 1972, schedules for nearly all industries collected data on total employment, number of women employees, number of production workers (in manufacturing and mining), construction workers (in contract construction industries) or nonsupervisory workers (in other nonmanufacturing industries), and for these workers payroll, paid man-hours, and for manufacturing overtime man-hours and payroll. The schedule contains detailed instructions and definitions for the reports.

The basic data-collection unit for the BLS sample is an establishment, which is defined as a single physical location, such as a factory, mine, or store where business is conducted.

Industry employment statistics published by BLS represent the total number of persons employed either full time or part time in nonagricultural establishments during a specified payroll period. Employed persons include those who are working full or part time on a permanent or temporary basis. Workers on an establishment payroll who are on paid sick leave (when pay is received directly from the employer), on paid holiday or paid vacation, or who work during only a part of the specified pay period and are unemployed or on strike during the rest of the period, are counted as employed.

In manufacturing industries, data are collected on production workers. This group, in general, covers those employees up through the level of working foremen, who are engaged directly in the manufacture of the product of the establishments. Among the exclusions from this category are persons in executive and managerial positions, and persons

engaged in such activities as accounting, sales, advertising, routine office work, professional and technical functions. Production workers in mining are defined in a similar manner.

Construction workers relate to a somewhat similarly defined class of workers in contract construction industries, while nonsupervisory workers are collected in transportation, communications, and public utilities and in trade, finance, and service industries.

In order to derive series on hours and earnings, the BLS collects the following data:

(a) The number of full- and part-time production and related workers, construction workers, or nonsupervisory workers who worked during, or received pay for, any part of the pay period including the 12th of the month.

(b) Total gross payrolls for the workers specified above, before deductions for old-age and unemployment insurance, group insurance, withholding tax, bonds, and union dues. The payroll figures also include pay for overtime, shift premiums, holidays, vacations, and sick leave paid directly by the firm to employees for the pay period reported. They exclude bonuses (unless earned and paid regularly each pay period) or other pay not earned in the pay period reported (e.g., retroactive pay). Tips and the value of free rent, fuel, meals, or other payment in kind are not included.

(c) Total man-hours worked (including overtime hours) during the pay period, hours paid for standby or reporting time, and man-hour equivalent man-hours for which employees received pay directly from the employer for sick leave, for holidays, vacations and other leave paid to these employees. Overtime or other premium paid hours are not

converted to straight-time equivalent hours.

(d) Overtime man-hours for which premiums were paid because the hours worked were in excess of the number of hours of either the straight-time workday or workweek. Saturday and Sunday hours (or 6th and 7th day hours) are included as overtime only if overtime premiums were paid. Holiday hours worked are not included unless they are paid for at more than the straight time rate. Hours for which only shift differential, hazard, incentive, or other similar types of premiums were paid are excluded from overtime hours. Overtime hours data are collected only from plants engaged in manufacturing activities.

The sample design currently used in the BLS industry employment statistics program is that of a modified cutoff sample. In a cutoff design, all establishments in a category are listed in sequence by number of employees. A cutoff point is selected in terms of the number of employees in an establishment, and only establishments above the cutoff point are included in the design. At present, sample selection is made by the cooperating State agencies at the area level with supplements for establishments in sections of the State lying outside the defined areas. The national sample is then the sum of all the State samples.

In cutoff sampling, the general objective is to obtain a sample comprising a large enough proportion of universe employment so that satisfactory estimates can be prepared. Since employer participation in the BLS programs is voluntary, some establishments above the cutoff may refuse to report. To replace these in the design, reports were

solicited for the next largest establishments below the cutoff until the desired employment coverage was attained. In addition, to meet the needs of preparing estimates of hours and earnings, procedures were introduced to secure representation of the smaller establishments in each industry. Because of this procedure, and also because sampling took place primarily at the level of the metropolitan areas, which vary greatly in size, the sample contains a considerable number of small establishments, together with a very substantial proportion of the larger establishments.

In the context of the Bureau of Labor Statistics employment statistics program, with its emphasis on producing timely data at minimum cost, a sample must be obtained which will provide coverage of a sufficiently large segment of the universe to provide reasonably reliable estimates which can be published promptly and regularly. The present sample meets these specifications for most industries. With its use the Bureau of Labor Statistics is able to produce preliminary estimates each month for many industries and for many geographic levels within a few weeks after reports are mailed to respondents, and at a somewhat later date, statistics in considerably greater industrial detail.

Nevertheless, the modified cutoff design described above leaves something to be desired in several respects. In the first place, since the sample is not a probability sample, no statements on sampling variability can be developed. Secondly, because the sample is over-weighted with the larger establishments, it is necessary to correct

for possible bias by stratifying the existing sample sizes and/or region for the computation of hours and earnings averages. These are weighted by estimates of employment for each stratum into industry averages. While this procedure improves the quality of the hours and earnings average, inadequate or unrepresentative samples, particularly in the smaller size classes, may still introduce biases into the estimates. Finally a cutoff design is an inefficient procedure for sampling in industries characterized by a substantial proportion of their employment in smaller establishments, as is the case in the trade and service industries.

All national, State, and area employment, hours, and earnings series are classified in accordance with the Standard Industrial Classification Manual. Bureau of the Budget, 1967.

The Bureau of Labor Statistics has introduced a modified sampling plan in its employment statistics program. This design provides for samples stratified by size using a form of optimum allocation known as sampling proportionate to average size of establishment. This plan makes the maximum use of modern sampling theory consistent with the institutional organization of the program. The plan calls for an addition of approximately 40,000 reports to the present sample and will take several years and favorable appropriations by the Congress to implement fully.

Reporting establishments are classified into significant economic groups on the basis of major product or activity as determined by percent of total sales or receipts data for the previous calendar year.

This information is collected once each year on an industry class supplement to the monthly report form. All data for an establishment making more than one product or engaging in more than one activity, are included under the industry of the most important product or activity, based on the percentages reported.

Texas Industry Occupational Matrix

In summary, in order to develop estimates of total cross-industry occupational employment in States and areas, it will be necessary in some cases to supplement the OES data with data from other sources. State and area occupational information should be developed independently of the OES program to provide the means through which cross-industry checks can be made. Through the use of such matrices, OES data can be supplemented from the sources listed below either to develop industry occupational ratios for low-employment occupations which were not on each survey questionnaire, or to provide more reliable data on an area basis where the survey samples might be too weak for use.

The national survey based industry-occupational employment ratios can be applied in certain industries to develop occupational employment estimates for selected occupations where the response rate is too low for the development of reliable estimates. Similarly, occupational patterns developed from survey data in one State can be used to develop occupational ratios in another State if it is found that the industries or establishments in an industry are basically similar in size, content, and technology in each State.

Census Data

The 1970 national Census occupational ratios can be applied to State industry employment levels for selected occupations to develop estimates for those occupations where data are not collected in the survey for the occupation industry cell.

The 1970 Census state occupational ratios can be applied to current levels of industry employment to develop current estimates of employment for selected occupations which do not appear on each industry questionnaire.

Each of the above mentioned procedures can be used by itself, or in combination with others, to provide more meaningful and useful State and area occupational employment estimates.

CHAPTER IV

THE OCCUPATIONAL SUPPLY DATA SUBSYSTEM-- A CHRONOLOGICAL DISCUSSION OF THE MAJOR INPUTS OF THE SUPPLY DATA SUBSYSTEM

Phase I Supply Data Subsystem

Public Vocational Education Training Programs

Enrollments in public vocational education programs: The number of individuals enrolled in each of 149 vocational programs identified by six digit USOE codes.

Source: USOE Form 3138

This form is a part of the Annual Report for Vocational Education which is prepared by TEA in October of each year and describes public vocational education program activities for the preceding Federal fiscal year ending June 30. USOE Form 3138 shows: (1) the number of males and females enrolled in each of 149 programs, (2) the number of these who are handicapped or disadvantaged, (3) the number enrolled at the secondary level in grades 9-12 and below grade 9, (4) the number enrolled at the postsecondary level, (5) the number of adult preparatory, supplemental, and apprenticeship enrollments, and (6) the number enrolled in cooperative programs.

Placement of program completions in public vocational education programs: The number of individuals completing each of 149 public vocational education programs and the subsequent placement of these individuals in the labor market.

Source: USOE Form 3139

This form is the final part of the Annual Report for Vocational Education which is prepared by TEA. USOE Form 3139 is prepared in December of each year and shows the placement status, as of November 15, of the individuals who completed public vocational education programs during the preceding Federal fiscal year ending June 30. The form shows (1) the number of completions in each of 149 vocational education programs, (2) the number who left each program with marketable skills prior to normal completion, (3) the number status unknown, (4) the number not available for placement, (5) the number continuing education at a higher level, (6) the number employed full time in the field trained or related field, and (7) the number unemployed.

Note: USOE Form 3139 is not yet available as a computer printout. Target date (tentative) for computer printout is December, 1973.

Enrollments in proprietary school vocational programs: The number of individuals enrolled in specific vocational programs conducted by proprietary schools subject to regulation by State Law.

Source:

Enrollment information is on file at each proprietary school. State law requires these schools to keep enrollment records, but there is no statutory requirement to report information from these records to TEA. State law requires the school records to be made available to TEA staff during inspection visits, so it is possible that procedures can be established for the collection of enrollment information by TEA staff.

Completions and placements, proprietary school vocational programs: The number of individuals completing specific vocational programs in proprietary schools and the subsequent placement of these individuals in the labor market.

Subsequent Secondary Input to Manpower Supply/Demand System by TEA

Enrollment, completion and placement information pertaining to academic educational programs administered by TEA (public school programs).

Source:

Information on public school enrollments and completions (graduates) is currently available from TEA EMIS (Education Management Information System) in computer printout format. Information on placement of academic students is not available but may become available if tentative plans for a student follow-up system is implemented.

PROGRESS REPORT

ON

DEVELOPMENT OF DATA RETRIEVAL SYSTEM

I. Forms in use during 1972-73 School Year

A. Adult:
1. Adult Vocational Education Class Organization Report (VOC-065R72)
2. Adult and Continuing Education (ACE) Class Report (VOC-074)

B. Postsecondary:
1. Public School Vocational Nursing Program Class Organization Report (VOC-072R72)
2. Public School Vocational Nursing Program Follow-up Report (VOC-073R72)

C. Postsecondary and Adult:
1. Personnel Assignment of Postsecondary and Adult Vocational Education Programs (PSE-021R72)
2. Follow-up of Postsecondary and Adult Completions and Dropouts with Saleable Skills in Vocational Education (PSE-022R72)
3. Enrollments of Postsecondary and Adult Vocational Education Programs (PSE-023R72)

D. Secondary:
1. Follow-up on Secondary Graduates and Dropouts with Saleable Skills (VOC-064R72)
2. Secondary Vocational Education Class Organization Report (VOC-066R72)
3. Class Organization Report for Secondary Production Agriculture or Homemaking Education (Useful) (VOC-069)

II. Forms to be added, hopefully, during 1972-73 School Year

Adult:
1. Follow-up on Adult Preparatory Completions in Vocational Education
2. Class Organization Report for Adult Production Agriculture or Homemaking Education

Source Data Available (Not in Order)

1. SVIE-USOE Code
2. Sex
3. Ethnicity
4. Target Population
5. Social Security Number
6. School District
7. County (can be grouped in Governor's Planning Regions)
8. Education Services Center (ESC)
9. Cooperative Area Manpower Planning System (CAMPS)
10. Central Cities
11. Statewide
12. Standard Metropolitan Statistical Area (SMSA)
13. Name

Form Number		
VOC-066*	1.	Secondary Vocational Education Class Organization Report
PSE-023R72	4.	Enrollments in Postsecondary Adult VOC-ED Programs
VOC-066R72*	9.	Secondary VOC-ED Class Organization Report
VOC-069	10.	Secondary Production Agriculture or Home-Ed (Useful)
(Form in Process)	11.	Public Schools VOE Nursing Class Organization Report
VOC-064R72	13.	Follow-up on Secondary Completions & Dropouts from VOC-ED Programs
PSE-022R72	14.	Follow-up on Postsecondary & Adult Students in VOC-ED Programs
(Form in Process)	15.	Follow-up on Adult Preparatory in VOC-ED Programs
(Form in Process)	16.	Public School Follow-up on COC-Nursing
PSE-023R73	20.	Enrollments in Postsecondary & Adult Vocational Education Programs
(Form in Process)	21.	Public School Adult Class Organization Report
(Form in Process)	22.	Adult Basic Education Enrollments & Teachers
(Form in Process)	23.	Adult Basic Follow-up
(In Conceptual Stage)	25.	Private & Proprietary Enrollments and Teachers
(In Conceptual Stage)	26.	Private & Proprietary School Student Follow-up

* USOE Forms 3138 and 3139 summarize individual record data on these forms.

The summary documents USOE 3138 and 3139 are excellent source documents for the supply data on the original and subsequent Vocational Education Demand Reports. However, the Human Resources Information System requires the data to come from the individual source documents such as VOC 066R72. (See Appendix D) It is recommended that the final design of the system should have non-duplicated original data.

Employment Services Automated Reporting System (Supply Data)

The Employment Services Automated Reporting System (ESARS), previously mentioned in the demand section, can provide additional supply information from data contained in the applicant master file data bank. This is an unduplicated count of the applicants registered for work in the various TEC local offices. This file can provide the occupations and other selected characteristics of all applicants registered with TEC. Occupations are coded to the Dictionary of Occupational Titles.

Phase II Supply Data Subsystem

Member Agencies Health and Human Resources Council

This supply source will be developed as each agency or member of the Human Resources Council provides input, or requests to provide input into the System. (See the Appendix for a list of the agencies of the Human Resources Council.) Report formats can be designed for the Supply Subsystem that will list enrollments summarized by occupation for several supply sources. For example, the Coordinating Board, Texas

College and University System, may have data on enrollments of students in higher education summarized by degree plan or major. This information can be reported in the Supply System Report section in addition to other specialized reports. Recognizing problems of classifying enrollment data by major and degree plan into occupational classifications requires additional research to be done before this data could be coded.

Special training and educational programs that are known to the various agencies could make use of the coding structures that will be used in the Supply System such as the USOE codes and the DOT codes and thereby use the System to have their information useful to others due to standardized coding.

Texas Rehabilitation Commission (TRC)

Records are kept by the Texas Rehabilitation Commission on the occupation of each of their recipients that have completed their training and have been placed in a job. This information could be developed in the System by calculating historical trends for these completions.

Regulatory Agencies

As more licensing operations are computerized by the many state licensing agencies, this information can be used in a system to report the geographic distribution of individuals licensed in particular occupations. (See the list of Licensing Agencies in the Appendix.) This information on individuals would probably constitute a specialized report from the System.

Bureau of Apprenticeship and Training

The Department of Labor, Bureau of Apprenticeship and Training, has a computerized record of all the individuals that are in the process of working as an apprentice. Here again the information could be used to show the geographic distribution of training of this sort and also used in specialized Supply reports as designed for the Supply and Demand System.

Population and Census Data

Economic assumptions underlying the population forecasts should not radically depart from those used in the occupational analysis. Forecasts should be reviewed to see whether their methodology is based on direct analysis of population variables. One way of appraising forecasts is to compare them to historical population trends. Decennial Census of Population data are available for over a hundred years. It will be highly instructive to plot economic indicators along with the census data. Economic indicators are highly correlated with employment data. Some indicators have lead correlation, while some have lag correlation.

Returnees from Military Service

Both draftees and retirees have an effect on labor supply. Either they will use a skill developed before induction, or a skill learned while they were in the service. The net number inducted and released with a marketable skill will have an effect on the labor supply. The problem is trying to calculate what the effect will be.

Oregon treated this and other supply data by applying statistically derived rates to state population add age data.

Women Re-entering Labor Market

Women are a large subset of the group titled labor market re-entrants. Phase II information is information that should be included in the overall model, however this data is not readily available. Oregon handles this category by using national accession rates on state female population figures.

Net Geographic Transfers

Both OTIS and the Oregon study indicated that this information would be useful. However, both studies agreed it would be more costly to obtain than the benefits derived.

Public Schools Enrollment and Drop-out Data

There is a distinction between this section and the section on public vocational education enrollments and drop-outs. The vocational programs graduate people with a marketable skill, while the general education programs give us data on the rest of the student population. With the non-vocational education data, predictions can be made on how many students will go to college, how many will marry, and how many will enter the labor force, etc.

CHAPTER V

THE HUMAN RESOURCES INFORMATION SYSTEM FOR TEXAS

Discussion of the Two Major Subsystems, Supply and Demand

The Phase I Supply Data Subsystem

The Phase I Data Supply Subsystem (refer to the flow chart) has four major Phase I inputs for the supply summary. The first major source of information would be the Public Vocational Education Training Programs. This data is collected by the Texas Education Agency (TEA) in a routine and consistent manner and is currently in machine readable form. The data forms (see Appendix D) that collect this information are adequate and can be revised as the situation requires and there should be no need for specialized forms. The information was collected on a "by individual" basis and includes certain identification information like Social Security Numbers that can be used to avoid duplication and other checking and verifying operations.

The second major input will be the Private Vocational Education Training Programs. The current system of regulating private schools or licensing private schools that is provided by law should be extended to include information on programs, enrollments, completions, and placements of the individuals in the private schools. This will require some administrative decisions and possibly some field work by the Proprietary School Division of Texas Education Agency.

The third major source of Supply information will be taken from the Employment Services Automated Reporting System (ESARS) on computer in the Texas Employment Commission. The active file in the ESARS system has information on skills of the unemployed by occupational DOT codes which can be used in the system. (Refer to the ESARS reports in the Appendix.) The ESARS Reporting System has information on other Department of Labor programs such as the WIN Program, MDTA, and others that can be tabulated and provided in machine readable form for input in the Human Resources Information System.

The fourth Phase I input in the Supply Subsystem is School Dropouts with Marketable Skills. This information is currently available in the Texas Education Agency and can be keypunched from existing data forms.

The Phase I Demand Data Subsystem

The Demand Subsystem has four major components. The first major input will be the Occupational Industry Matrix described in Tomorrow's Manpower Needs publication of Department of Labor which will give the occupational demand for Texas calculated from industry employment projections and employment patterns based on a national matrix.

The second major source of input for the Demand Subsystem is the Job Openings tabulated in the Employment Services Automated Reporting System (ESARS). This data is accumulated on a statewide basis and can be provided in machine readable form as input into the System.

The third Phase I source of Demand data is the Occupational Employment Statistics Program of the United States Department of Labor.

This is the survey operation where data is collected from employers in the state and processed to provide state occupational employment levels. This program, when available in Texas, will constitute a major part of the Demand Subsystem.

The fourth Phase I source of Demand information will be from special studies such as the study at Texas A & M by Dr. Conrad Fritsch in the Agricultural Occupations. Special studies will always be needed to verify occupational descriptions and create new occupational codes when new occupations are discovered. Special studies can be used for a checking and validating operation in the Demand Subsytem.

Evaluation and Feedback

There are several factors influencing evaluation techniques concerning the Human Resources Information System.

One problem is to develop evaluation criteria. Feedback information on how the system's output is used, who uses it, to what extent, how close the forecasts are to actual figures is necessary to determine evaluation criteria or to define indicators of success.

Success could be defined as obtaining a goal of a balanced ratio of supply versus demand in one occupation or every occupation. It is generally agreed that the supply of manpower for an occupation must be greater than the demand because every occupation has an attrition rate. The attrition rate is not the same for every occupation. The attrition rate depends on the ratio of supply versus demand and the fact that not every graduate trained for a certain vocation enters that particular occupation. Therefore, every occupation has an attrition rate. The magnitude depends on the supply versus demand. If the demand exceeds the supply, the attrition rate will be lower. Similarly, if the supply exceeds demand by more than a normal attrition rate, the attrition rate will grow. The major point to be concerned with is to avoid the negative outcome of an unbalanced ratio between supply and demand.

There are some negative factors influencing evaluation procedures. They are budget, time frame and human resources. The budget will always be a limiting factor for both the successful completion of the project and its evaluation. Instead of developing an evaluation test instrument to more accurately obtain feedback, the evaluation team might resort to sending out letters to solicit feedback.

The time frame has to be considered on both the project and its evaluation. There are four time periods to be considered:

(1) The optimum time of the year for securing data in terms of state agency or regional organization convenience.

(2) The time lapse between receipt of evaluation instruments by users and return to evaluation team.

(3) The time necessary for data processing and analyzing the evaluation data.

(4) Schedule requests for evaluation results by state agencies and other users, e.g., Advisory Council and U.S. Office of Education.

The Human Resources aspect is determined by the local labor market conditions and the budget.

Brief Discussion of Current Prediction Methodologies

Any forecasting model worth using internalizes as many potential influences on employment as possible, subject to the practical constraints of time, money and knowledge. Ideally, since employment depends on indivvidual decisions to supply labor (determined by tastes and the value of alternative uses of one's time) and industry requirements (determined by available technologies, resource costs and product market conditions), one could feel more comfortable about forecasts covering an area which roughly defined a homogeneous labor and product market. In practice, area planners can rarely control for product market conditions, since intermediate and final goods in most industries pass in and out of local areas, often in response to forces far beyond the planning area.

An ideal forecasting model, from the vocational education planner's point of view should incorporate the following:

(1) Demand and supply forecasts. Forecasts of occupational requirements should be complemented by estimates of available supply within a certain geographic distribution of employment, including individuals within the vocational education system. Break downs on the supply side by age, sex, race and possibly aptitude will be required to evaluate vocational education performance in meeting needs of disadvantaged groups. Supplemental data on wage levels and trends, based on employer surveys, will be needed to bolster occupational forecasts in different occupations. These data strengthen supply forecasts as well, by suggesting which occupations are (or are becoming) relatively attractive from a pecuniary point of view.

(2) Classification detail sufficient to match curriculum content with skill requirements of a given job or job cluster. This requirement assumes such a match is in fact possible or meaningful, a point which receives more treatment below.

(3) Technology predictions, detailed enough to allow expert assessment of required qualitative and quantitative changes in curriculum generated by productivity changes.

The ideal manpower forecasting process in general may be viewed in a systems framework. Three subsystems, the labor market, the forecasting process and the socio-political process constitute interacting parts of this larger system. The simple notion that labor market data

furnish inputs to the forecasting process without receiving explicit feedback from other subsystems may be reasonable in the short run. It is probable, however, that over time manpower forecasts, correct or not, have independent power to influence how actors in the labor market system behave. In the extreme, forecasters may generate self-fulfilling prophesies. Events in the socio-political realm, such as budget cutting, may affect the quantity and quality of data entering a forecast. And the accuracy of a projection may feed back upon the socio-political system, influencing succeeding years' enthusiasm for the exercise of manpower forecasting.

A competent forecaster should bear in mind the complex interrelationships of these processes. In addition, his forecasting model should measure up to the following requirements:

(1) The technique should be replicable at different times and in different places. This requirement concerns cost as well as technical complexity of the model.

(2) All assumptions of the model should be reasonable, and should be explicitly and clearly stated.

(3) The structure of the model should be thoroughly explained, in language understandable to potential users of the model.

(4) Forecasted estimate errors should be included.

(5) Forecasted subtotals should be internally consistent, and should be cross-checked to prove consistency.

(6) Accuracy analysis should be an integral part of the forecasting process.

Generally it is wise to separate the model used in forecasting from the model's data inputs when evaluating the effectiveness of a given technique. A rigorous approach, standard among many social scientists, specifies that the researcher first construct his model (assumptions, definitions and hypothesized relationships) and then seek out an appropriate data base to test the model. The model's structure and component variables supply enough information concerning how much and what kinds of data are needed.

Options available to policy-makers often force less rigor, however. Statistics collected by governmental agencies, as a matter of course, suggest indicators which busy planners can use to chart evolving trends in labor markets. Data can determine the model applied instead of the reverse. It is quite difficult to evaluate such a "model" without simultaneously evaluating the data inputs, since the two are tied. On the other hand, a forecaster may have constructed an a priori model, based on well understood principles of economics, only to modify it subsequently as data limitations become apparent. In this case, the analyst can separate structural and data questions, recognizing that a model may be testable from a variety of data bases and at different levels of aggregation.

There are four general categories of models:

Unspecified: Usually data-generated techniques, the assumptions and structure of which are not spelled out.

Specified technological models: Models in this category reflect technological assumptions about production, which generate fixed (or changing in accordance with exogenously specified trends) employer

demands for and worker supplies of labor. In economic terms, we talk of fixed production coefficients, invariant to changes in relative resource costs. Assumptions may or may not be spelled out, and technological forecasts may vary in complexity from simple extrapolations to complex input-output projections.

Specified economic models: Systems which are offered to explain employer and worker behavior under the economic assumptions of maximizing net benefits from some activity comprise this category. Measured parameters reflect the best approximation to optimal solutions that the researcher can obtain. Linear programming and cost/benefit approaches are common types of economic models. It should be noted that forecasts based on static optimization may or may not exhibit the economic sophistication of the original model.

Specified predictive models: Least squares regression estimates of supply/demand forces in a labor market fall in this category. Forecasts should, in a tightly structured fram work of this kind, be replaced by predictions or simulations based on a relatively thorough understanding of the systems' behavioral characteristics. Optimizing, in the sense used above, is not always an explicit feature of predictive models, though the assumption of classical economics, that employers maximize profits, for example, is part of the implicit behavioral structure.

New Developments to Consider for Possible Inclusion Into a Future Information System

To date, there is information on two new projects worth considering for possible future use.

Job Bank System

A dramatic change is taking place in TEC local placement offices. In fiscal year 1970, the Job Bank was only operational in San Antonio and planned for Houston and the Dallas-Fort Worth area.

Job Bank is essentially a computer-assisted system of listing and updating job orders on a daily basis and providing for their distribution to TEC offices and other manpower agencies within a designated area. "Job Bank Books" are openly displayed and registered applicants are encouraged to select their own job listings.

The Job Bank System produces fresh Job Bank Books every day and the computer system automatically updates all referral and placement activity to assure that the information is up-to-date. TEC interviewers and counselors also examine job listings on behalf of registered applicants, using microfilm readers which display the same jobs listed in the Job Bank Books.

The number of Job Banks will continue to expand during fiscal year 1972 with new installations planned for Amarillo, Lubbock, Midland-Odessa, Austin, Longview-Tyler-Marshall, and Texarkana. At the same time, the coverage of Job Banks will be extended to take in the nearby cities until eventually a statewide Job Bank System will evolve.

Experimentation in Computer-Assisted Job Matching

Texas is one of ten states involved in conducting a series of controlled experiments dealing with finding the most effective use for the computer in the process of matching applicants and jobs. Corpus Christi has been chosen as the test site for this long-range experimental effort.

During fiscal year 1972, a new vocabulary of occupational descriptors will be tested for its ability to provide discrete matching capability. These descriptors or "keywords" will then be tested in a series of computer processing modes and with a number of different search strategies and scoring systems. Hopefully, by January of 1976 sufficient experimentation will have been conducted to enable the employment service to install a nationwide network of compatible matching systems.

It should be recognized, however, that matching is not the sole concern. Much of the effectiveness of such a system will be attributed to the validity of the data used in matching, the most effective dissemination of job information, the optimum telecommunications facilities, and improved job development aids. Each of these areas is also under study in an effort to develop an over-all plan of attack.

Since computer-assisted matching is already operational in other experiments in Utah, California, New York and Wisconsin, a great deal is already known concerning the techniques for matching. TEC's efforts will be principally directed toward experimentation and innovation in order that the optimum system can be pressed into service before 1976.

Phase I Report--Texas Vocational Education Demand Data

The following page is a sample report form designed to specifications of Tables IA and IB of the Texas State Plan for Vocational Education. The Report form shows demand and supply side by side with a net difference. Then, supply, demand and the net difference are shown with predictions one year and five years hence.

Another feature of the form is the Dictionary of Occupational Titles to U.S. Office of Education Instructional Codes. This relates a digital identification of jobs to educational training programs used to train people for that particular job. In most cases the programs are clustered around the job classification.

TEXAS VOCATIONAL EDUCATION DEMAND DATA

FOR STATEWIDE

Date Report Prepared

_____

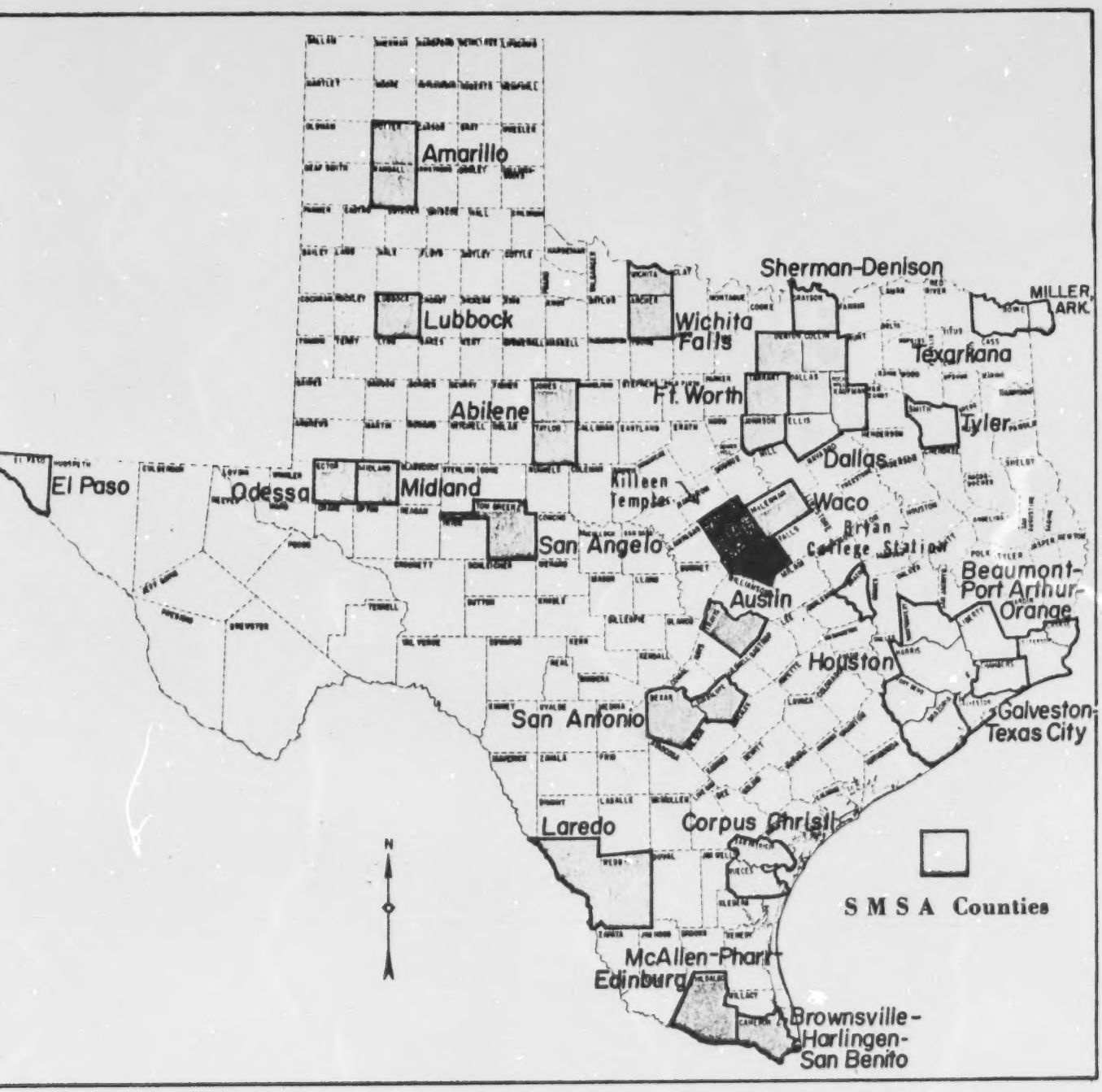
DICTIONARY OF OCCUPATIONAL TITLES		U.S. Office of Education Instructional Code	CURRENT REQUIREMENTS			PROJECTED REQUIREMENTS					
						1 Year Hence 1974			5 Years Hence 1978		
Code	Title		Demand	Supply	Net Difference	Projected Demand	Projected Supply	Net Difference	Projected Demand	Projected Supply	Net Difference

Phase II--Possible Future Reports for the State Geographic Areas

Same as Phase I Except by
SMSA and/or Planning Region

The following regional maps and sample report forms show the same report as in Phase I, except by regions. The purpose of showing these sample report forms is to demonstrate the need for regional as well as statewide level data. Every Standard Metropolitan Statistical Area (SMSA) or Texas Planning Region honor county boundaries. Educational and/or Manpower Planning staffs need data to the SMSA or Planning Region to make more accurate plans and forecasts.

STANDARD
METROPOLITAN STATISTICAL AREAS



TEXAS PLANNING REGIONS

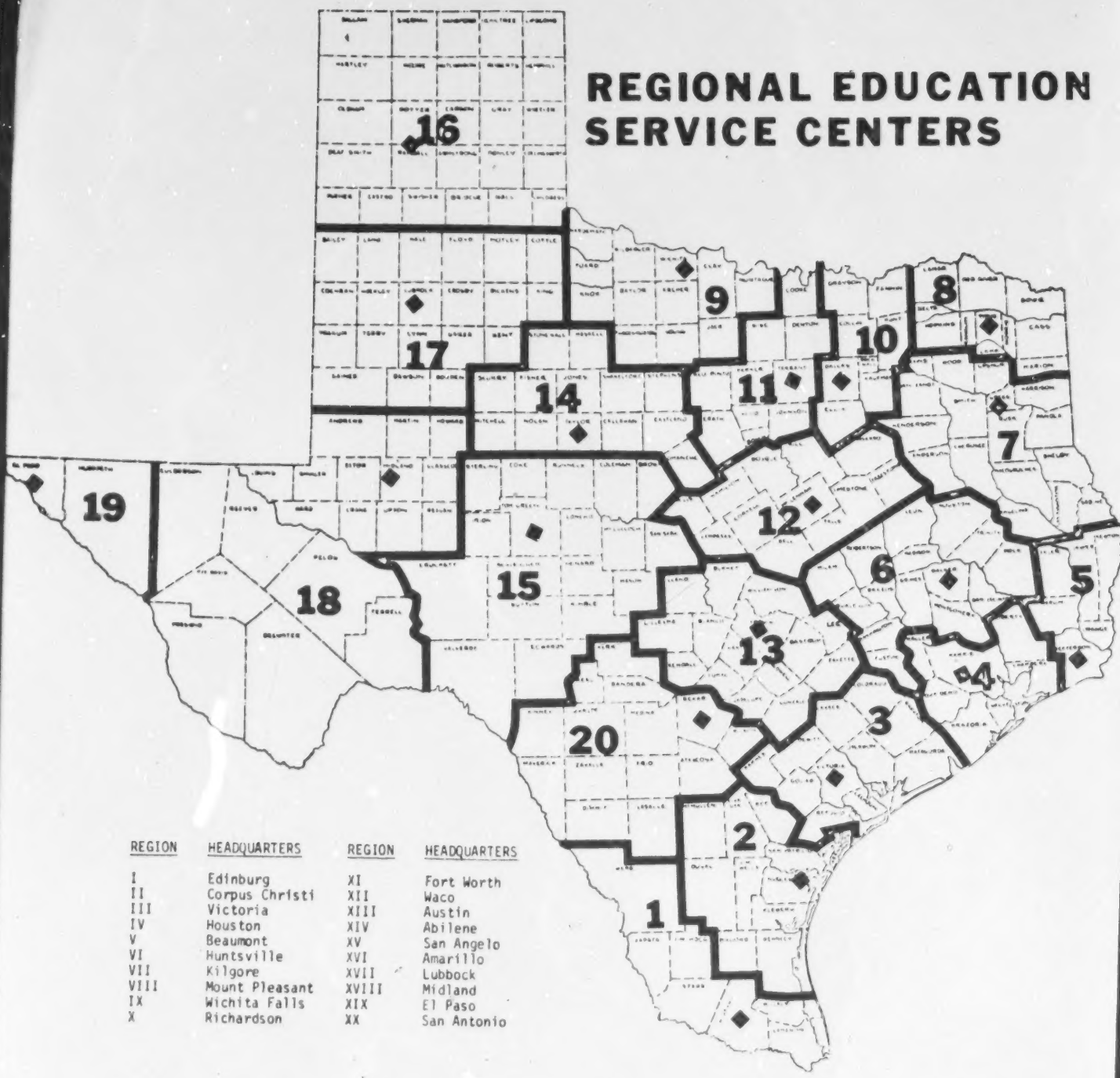
TEXAS EMPLOYMENT COMMISSION

Districts and Offices

- District Boundary
- District Offices
- Local Offices
- Suboffices
- Counties Served

July 1, 1972

REGIONAL EDUCATION SERVICE CENTERS



REGION	HEADQUARTERS	REGION	HEADQUARTERS
I	Edinburg	XI	Fort Worth
II	Corpus Christi	XII	Waco
III	Victoria	XIII	Austin
IV	Houston	XIV	Abilene
V	Beaumont	XV	San Angelo
VI	Huntsville	XVI	Amarillo
VII	Kilgore	XVII	Lubbock
VIII	Mount Pleasant	XVIII	Midland
IX	Wichita Falls	XIX	El Paso
X	Richardson	XX	San Antonio

PLANNING REGIONS

A FRAMEWORK FOR THE REGIONALIZATION OF PLANNING ASSISTANCE

LEGEND:

Planning Region A – Headquarters in Corpus Christi

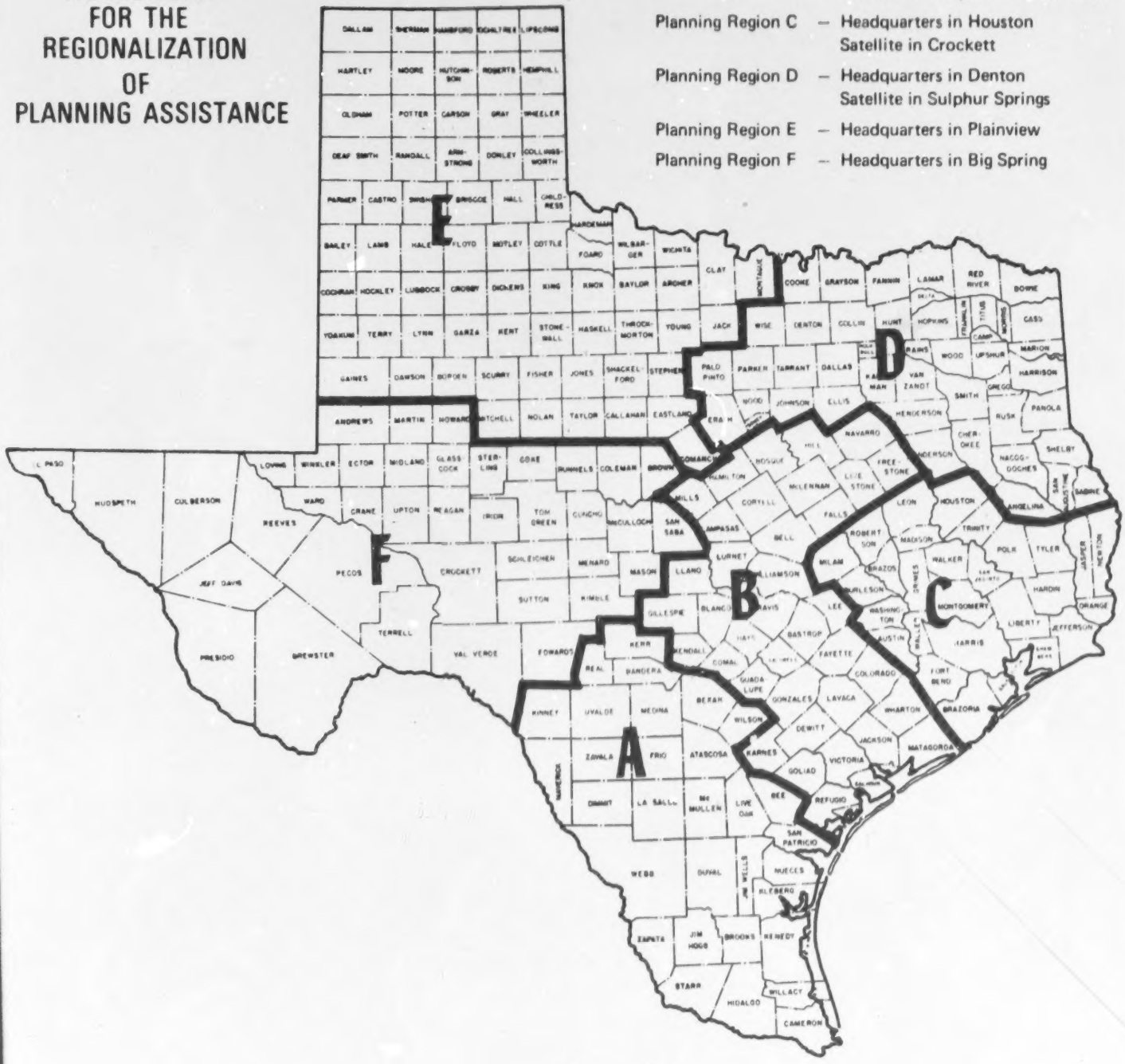
Planning Region B – Headquarters in Austin
Satellites in Stephenville and Waco

Planning Region C – Headquarters in Houston
Satellite in Crockett

Planning Region D – Headquarters in Denton
Satellite in Sulphur Springs

Planning Region E – Headquarters in Plainview

Planning Region F – Headquarters in Big Spring



TEXAS VOCATIONAL EDUCATION DEMAND DATA

FOR SMSA

Date Report Prepared

_____

DICTIONARY OF OCCUPATIONAL TITLES		U.S. Office of Education Instructional Code	CURRENT REQUIREMENTS			PROJECTED REQUIREMENTS					
						1 Year Hence 1974			5 Years Hence 1978		
Code	Title		Demand	Supply	Net Difference	Projected Demand	Projected Supply	Net Difference	Projected Demand	Projectec Supply	Net Difference

TEXAS VOCATIONAL EDUCATION DEMAND DATA

FOR PLANNING REGION

Date Report Prepared

_____

DICTIONARY OF OCCUPATIONAL TITLES		U.S. Office of Education Instructional Code	CURRENT REQUIREMENTS			PROJECTED REQUIREMENTS					
						1 Year Hence 1974			5 Years Hence 1978		
Code	Title		Demand	Supply	Net Difference	Projected Demand	Projected Supply	Net Difference	Projected Demand	Projected Supply	Net Difference

TEXAS SUPPLY/DEMAND REPORT

October 24, 1972

A RANK ORDERING OF PROGRAM CLUSTERS

AND POTENTIAL PROGRAM CLUSTERS BY DEMAND MINUS SUPPLY

Ascending Rank		MAN POWER DEMAND MINUS MAN POWER SUPPLY																							
			Texas Standard Metropolitan Statistical Area (SMSA)																						
		State Totals	1 Abilene	2 Amarillo	3 Austin	4 Beaumont Port Arthur Orange	5 Brownsville Harlingen San Benito	6 Corpus Christi	7 Dallas	8 El Paso	9 Fort Worth	10 Galveston Texas City	11 Houston	12 Laredo	13 Longview Kilgore Gladewater	14 Lubbock	15 McAlen Pharr Edinburg	16 Midland Odessa	17 San Angelo	18 San Antonio	19 Texarkana	20 Tyler	21 Waco	22 Wichita Falls	

TEXAS SUPPLY/DEMAND REPORT

October 24, 1972

A RANK ORDERING OF PROGRAM CLUSTERS

AND POTENTIAL PROGRAM CLUSTERS BY DEMAND MINUS SUPPLY

Descending Rank		MAN POWER DEMAND MINUS MAN POWER SUPPLY																										
			Texas Standard Metropolitan Statistical Area (SMSA)																									
		State Totals	Abilene 1	Amarillo 2	Austin 3	Beaumont Port Arthur Orange 4	Brownsville Harlingen San Benito 5	Corpus Christi 6	Dallas 7	El Paso 8	Fort Worth 9	Galveston Texas City 10	Houston 11	Laredo 12	Longview Kilgore Gladewater 13	Lubbock 14	McAllen Pharr Edinburg 15	Midland Odessa 16	San Angelo 17	San Antonio 18	Texarkana 19	Tyler 20	Waco 21	Wichita Falls 22		

TEXAS SUPPLY/DEMAND REPORT

October 24, 1972

A RANK ORDERING OF PROGRAM CLUSTERS

AND POTENTIAL PROGRAM CLUSTERS BY DEMAND MINUS SUPPLY

Ascending Rank	PROGRAM CLUSTER (Office of Education Codes)	MAN POWER DEMAND MINUS MAN POWER SUPPLY																						
		STATE TOTALS	Texas Planning Regions																					
			1 Pan Handle	2 South Plains	3 North Texas	4 North Central Texas	5 North East Texas	6 East Texas	7 West Central Texas	8 Upper Rio Grande	9 Permian Basin	10 Concho Valley	11 Central Texas	12 Capital	13 Brazos Valley	14 Deep East Texas	15 South East Texas	16 Gulf Coast	17 Golden Crescent	18 Alamo	19 South Texas	20 Coastal Bend	21 Low Rio Grande Valley	22

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TEXAS SUPPLY/DEMAND REPORT

October 24, 1972

A RANK ORDERING OF PROGRAM CLUSTERS

AND POTENTIAL PROGRAM CLUSTERS BY DEMAND MINUS SUPPLY

Descending Rank	PROGRAM CLUSTER (Office of Education Codes)	MAN POWER DEMAND MINUS MAN POWER SUPPLY																										
		STATE TOTALS	Texas Planning Regions																									
			1 Pan Handle	2 South Plains	3 North Texas	4 North Central Texas	5 North East Texas	6 East Texas	7 West Central Texas	8 Upper Rio Grande	9 Permian Basin	10 Concho Valley	11 Central Texas	12 Capital	13 Brazos Valley	14 Deep East Texas	15 South East Texas	16 Gulf Coast	17 Golden Crescent	18 Alamo	19 South Texas	20 Coastal Bend	21 Low Rio Grande Valley	22		

Occupations Not Trained in Vocational Education Jobs

This report was designed as a Phase II report because the overall system includes all occupations including those in vocational euucation. This is where the system should be when it reaches its fullest potential.

Special Reports by Occupation for Special Categories

Special reports are not an exception to the final system. They should supplement the system. This report form shows Agriculture and Agri-Business but it could be any special job occupation cluster. It should be pointed out that the reports could be statewide, by SMSA, and by Governor's Planning Region.

TEXAS SUPPLY/DEMAND INFORMATION SYSTEM FOR

VOCATIONAL EDUCATION

SPECIAL REPORT ON AGRIBUSINESS OCCUPATIONS

DICTIONARY OF OCCUPATIONAL TITLES		U.S. Office of Education Instructional Code	CURRENT REQUIREMENTS			PROJECTED REQUIREMENTS					
						1 Year Hence 1974			5 Years Hence 1978		
Code	Title		Demand	Supply	Net Difference	Projected Demand	Projected Supply	Net Difference	Projected Demand	Projected Supply	Net Difference

Conclusions and Recommendations

Conclusions:

--Texas is very dissimilar in population, geographic size, and industrial mix from the states studied that have a manpower supply/demand system and therefore a Texas Human Resources Information System must be designed.

--The national industry-occupational profiles are not completely adequate for Texas because Texas is not an average state. Texas should have an industry-occupational matrix based on Texas data.

Recommendations:

1. Establish Advisory Committee by Executive Order. The Committee should be similar to the OTIS Committee to direct and advise the design team. The Committee consisting of:

   A. Advisory Council for Vocational Education

   B. Office of Information Services, Office of the Governor

   C. Texas Education Agency and Texas Employment Commission

   D. Future expansion to add other members of the Interagency Health and Human Resources Council

   - Coordinating Board, Texas College and University System
   - Texas Industrial Accident Board
   - Texas State Department of Health
   - Texas Department of Mental Health and Mental Retardation
   - Office of Comprehensive Health Planning, Office of the Governor
   - State Department of Public Welfare
   - The University of Texas System
   - Texas Rehabilitation Commission
   - State Commission for the Blind
   - Texas Commission on Alcoholism
   - Texas Department of Community Affairs
   - Texas Water Quality Board
   - Texas Industrial Commission

2. Retain the existing Task Force as the Working Group of the Council to review, consult with and advise the Design Team and the Advisory Committee.

3. Establish a computer system Design Team. The team to include members from the Texas Education Agency, Texas Employment Commission, Office of Information Services--using Washington support from Bureau of Labor Statistics and United States Office of Education where possible.

4. Design the demand subsystem by the computerization of the Texas Employment Outlook to 1975 by Industry and Occupation. Technical assistance is available from Department of Labor--Bureau of Labor Statistics including computer tapes of the existing national matrix (Industry 116 x 126 Occupations) and the development of a Texas matrix based on 1970 census data (Industry 228 by 440 Occupations).

5. Design a detailed Texas Industry-Occupation Matrix based on actual survey data (using one or more of the alternatives listed below).

   Alternative A

   Occupational Employment Statistics (OES) Program should be started as soon as the Department of Labor has funds for Texas. It is recommended that the JOLTS program be terminated and the funds applied to the OES program for Texas.

   Alternative B

   Texas fund the Occupational Employment Statistics (OES) Program under Department of Labor auspices until such a time as the Department of Labor has funds to fully finance the program.

Alternative C

Request of employers covered by the Texas Unemployment Compensation Act to submit Quarterly Wages List (Form C-4A) with payroll titles for each employee. This data is in addition to name, social security number, and wages paid as now required.

6. Design the supply subsystem utilizing all available data sources.
7. Complete the computerization of the Texas Education Agency data base of secondary and post-secondary information in the Management Information Center--Public and Private Schools.
8. Design the Texas Human Resources Information System by utilizing the knowledge gained in steps 1 through 7.
9. Design evaluation and review techniques for the Information System.

THE ADVISORY COUNCIL FOR TECHNICAL – VOCATIONAL EDUCATION
IN TEXAS
(Advisory Council to the State Board of Education)
P. O. Box 1886
Austin, Texas 78767

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November 10, 1972

To: Tri-Agency Task Force

From: Alton D. Ice

The Task Force deserves commendation for the excellent investigation and background information compiled and for the design developed to date for a manpower supply/demand information system in Texas.

The Advisory Council continues to assign top priority to this system in its recommendations to the State Board of Education as contained in the Third Annual Report, dated October 1972, with specific reference to pages 19, 20 and 44.

As the work of the Task Force moves into the critical phase of inter-agency involvement and commitment, we would like to emphasize the necessity that the design meets the needs of the citizens of Texas and lesser needs should be products of the system and not the goals of the system. The need for information from this system for education planning and management is long past due and the system will require all of the elements and considerations outlined in the Council's deliberation on the subject, and no doubt many more, as the system is developed to meet the comprehensive needs of the citizens of Texas.

ADI:nl

PURPOSE: "To establish a climate conducive to the development of technical, vocational, and manpower training in educational institutions in the State of Texas to meet the needs of industrial and economic development of the state."